

4178

THE ASTROPHYSICAL JOURNAL



THE
ASTROPHYSICAL JOURNAL

An International Review of Spectroscopy and
Astronomical Physics

EDITORS

GEORGE E. HALE
*Solar Observatory of the Carnegie
Institution*

EDWIN B. FROST
*Yerkes Observatory of the University
of Chicago*

COLLABORATORS

J. S. AMES
Johns Hopkins University

A. BÉLOPOLSKY
Observatoire de Poulkova

W. W. CAMPBELL
Lick Observatory

HENRY CREW
Northwestern University

N. C. DUNÉR
Astronomiska Observatorium, Upsala

C. FABRY
Université de Marseille

C. S. HASTINGS
Yale University

WILLIAM HUGGINS
Tulse Hill Observatory, London

H. KAYSER
Universität Bonn

A. A. MICHELSON
University of Chicago

ERNEST F. NICHOLS
Columbia University

A. PÉROT
Paris

E. C. PICKERING
Harvard College Observatory

A. RICCÒ
Osservatorio di Catania

C. RUNGE
Universität Göttingen

ARTHUR SCHUSTER
The University, Manchester

H. C. VOGEL
Astrophysikalisches Obs., Potsdam

F. L. O. WADSWORTH
Morgantown, W. Va.

C. A. YOUNG *Hanover, N. H.*

VOLUME XXIII
JANUARY—JUNE, 1906

CHICAGO
The University of Chicago Press
1906

PRINTED AT
The University of Chicago Press
CHICAGO

CONTENTS

NUMBER I

	PAGE
A PROGRAM OF SOLAR RESEARCH. George E. Hale - - - -	1
SOME TESTS OF THE SNOW TELESCOPE. George E. Hale - - -	6
PHOTOGRAPHIC OBSERVATIONS OF THE SPECTRA OF SUN-SPOTS. George E. Hale and Walter S. Adams - - - - -	11
SOME NOTES ON THE H AND K LINES AND THE MOTION OF THE CALCIUM VAPOR IN THE SUN. Walter S. Adams - - - - -	45
THE FIVE-FOOT SPECTROHELIOGRAPH OF THE SOLAR OBSERVATORY. George E. Hale and Ferdinand Ellerman - - - - -	54
LINE STRUCTURE, I. P. G. Nutting - - - - -	64
PHOTOGRAPHIC PHOTOMETRY OF SHORT-PERIOD VARIABLE STARS. J. A. Parkhurst and F. C. Jordan - - - - -	79
MINOR CONTRIBUTIONS AND NOTES: Reply to Recent Statements by M. Deslandres, George E. Hale, 92; Solar Eclipse of August 30, 1905, John A. Miller, 93; Diffraction Grating Replicas, Robert James Wallace, 96.	

NUMBER II

THE PERIODICITY OF SUN-SPOTS. Arthur Schuster - - - -	101
ULTRA-VIOLET ABSORPTION SPECTRA IN RELATION TO PHYSICO-CHEMICAL PROCESSES. E. C. C. Baly and C. H. Desch - - - -	110
PRELIMINARY RESULTS OF THE UNITED STATES NAVAL OBSERVATORY ECLIPSE EXPEDITION IN 1905. Colby M. Chester - - - -	128
A GREAT PHOTOGRAPHIC NEBULA NEAR π AND δ SCORPIL. E. E. Barnard	144
A PROPOSED METHOD FOR THE DETERMINATION OF RADIAL VELOCITIES OF STARS. George C. Comstock - - - - -	148
MINOR CONTRIBUTIONS AND NOTES: On the Spectrum of the Spontaneous Luminous Radiation of Radium, Sir William and Lady Huggins, 152; Observations Made with Selenium Cells during the Total Solar Eclipse of August 30, 1905, Th. Wulf and J. D. Lucas, 153; Recent Formulæ for Distribution of Spectrum Lines in Series, T. S. Elston, 162; The Astronomical and Astrophysical Society of America, 166; Letter from Professor Callendar, 167; Note on Professor Newcomb's Observation of the Zodiacal Light, E. E. Barnard, 168.	

REVIEWS: Spectroscopy, E. C. C. Baly (Henry Crew), 170; Beiträge zur Photochemie und Spectralanalyse, J. M. Eder and E. Valenta (E. B. F.), 171; Mathematical and Physical Papers, G. G. Stokes (J. S. Ames), 173; Newcomb-Engelmann's Populäre Astronomie, H. C. Vogel (F.), 174; Manual of Advanced Optics, C. Riborg Mann (A. G. S.), 175; Die optischen Instrumente, Moritz von Rohr (Stanley C. Reese), 176; An Introduction to the Study of Spectrum Analysis, W. Marshall Watts (E. B. F.), 177; Handbuch der geographischen Ortsbestimmung für Geographen und Forschungsreisende, Adolph Marcuse (J.), 178.	PAGE
ERRATA - - - - -	180

NUMBER III

THE SPECTRUM OF HYDROGEN IN THE REGION OF EXTREMELY SHORT WAVE-LENGTHS. Theodore Lyman - - - - -	181
THE RELATION BETWEEN THE SPECTRA OF SUN-SPOTS AND FOURTH-TYPE STARS. Walter M. Mitchell - - - - -	211
LINE STRUCTURE. II. THEORY OF BROADENING, DOUBLING, AND REVERSAL. P. G. Nutting - - - - -	220
AN ATTEMPT TO FIND THE CAUSE OF THE WIDTH AND OF THE PRESSURE-SHIFT OF SPECTRUM LINES. W. J. Humphreys - - - - -	233
THE LUMINOSITY OF THE BRIGHTEST STARS. George C. Comstock - - - - -	248
MINOR CONTRIBUTIONS AND NOTES: Determination of Radial Motions by Objective Prisms, Edward C. Pickering, 255; Stars Having Peculiar Spectra; Thirteen New Variable Stars, Edward C. Pickering, 257; The Spectrum of <i>Nova Aquilae</i> No. 2, J. H. Moore, 261; A List of Four Stars Whose Radial Velocities are Variable, J. H. Moore, 263; Spectrographic Observations, Edwin B. Frost, 264; Note on the D. O. Mills Expedition to the Southern Hemisphere, W. W. Campbell, 269.	

NUMBER IV

SAMUEL PIERPONT LANGLEY. C. G. Abbot - - - - -	271
ON THE DISTRIBUTION OF BRIGHTNESS OF THE ULTRA-VIOLET LIGHT ON THE SUN'S DISK. K. Schwarzschild and W. Villiger - - - - -	284
A NEW METHOD FOR THE DISCOVERY OF ASTEROIDS. Joel H. Metcalf - - - - -	306
A NEW METHOD FOR DETERMINING THE RATE OF DECREASE OF THE RADIATING POWER FROM THE CENTER TOWARD THE LIMB OF THE SOLAR DISK. W. H. Julius - - - - -	312
THE SPECTRA OF SULPHUR DIOXIDE. Frances Lowater - - - - -	324

CONTENTS

vii

MINOR CONTRIBUTIONS AND NOTES: Remarks on Mr. C. L. Poor's Papers on the Figure of the Sun, L. Ambronn, 343; Note on the Ultra-Violet Radiation of Sun-Spots and Faculae, K. Schwarzschild and W. Villiger, 345; A Theory for the Distribution of Spectral Lines in Series, T. S. Elston, 346; The Present Condition of Rowland's Ruling Machines, J. S. Ames, 348.	PAGE
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

NUMBER V

THE SYSTEM OF CASTOR. Heber D. Curtis - - - - -	351
ON REFLECTING TELESCOPES OF RELATIVELY SHORT FOCUS. H. C. Vogel	370
A LARGE QUARTZ SPECTROGRAPH. Percival Lewis - - - - -	390
OBJECTIVE-PRISM COMPARISON SPECTROGRAPH. De Lisle Stewart -	396
SUN-SPOT LINES IN THE SPECTRA OF RED STARS. George E. Hale and Walter S. Adams - - - - -	400
MINOR CONTRIBUTIONS AND NOTES: Note on the <i>Algol</i> System, R. J. A. Barnard, 406; Letter from Professor H. L. Callendar, 408.	